

#### ABSTRACT OF THE DISCLOSURE

A method of regulating a relative humidity of a gas supplied to a cathode side of a fuel cell stack includes controlling a flow of feedback gas from the cathode side to a compressor to adjust the relative humidity of the gas. Injected water into the compressor is vaporized in the compressor to further adjust the relative humidity of the gas. The gas is discharged at a pressure that is sufficient for use in the fuel cell stack. Water is injected into the compressor. Vaporizing is achieved using heat generated through compression. A compression pressure of the compressor is adjusted based on a quantity of the water to vaporize the water therein.